The world's leading expert in crowd science reflects on the impact of Covid-19

Interview with Keith Still

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Uncover editors in conversation with Keith Still (Professor of Crowd Science at Manchester University) on the impact of the pandemic on the events industry and crowd management in particular.

You regularly indicate that crowd management is learning by doing, and that it is important to apply science and educate crowd managers with solid knowledge. As an introduction into your work, can you explain this experience?

My work focuses on incorporating the element of science into crowd management. Thirty years ago, it was all learning by doing, which meant you could only do it better after something went wrong. When we look back in history, we can see that accidents had a typical characteristic set of failures. My entire focus was initially on, 'What are the causes of accidents and incidents and what do we need to put it in place to prevent them happening again?' That meant working with computer simulations, as you could not test a crowd to destruction. Simulations of crowds can help us understand how incidents can occur. There is a proportion of mathematics and a proportion of understanding psychology and influences involved. I started teaching in 1999 to crowd managers and quicky learned that I had to bring down the core science lessons from the simulations down to practical useful tools that managers could implement. I spent 5 years trying just to understand how to teach the principles of crowd safety and crowd risk analysis. There is a difference between the crowd scientist, who tries to understand situations, and a crowd manager, who reacts on what he learned before. Anything we develop from the computer simulations, as computer scientists, was far away from the level that people who needed to implement crowd science to keep crowds safe.

Looking at the pandemic, did the body of knowledge from crowd science help to improve crowd management?

I am not an epidemiologist, but it was factoring into our risk assessment methodologies for the Covid-19 situations. It was nice to see that when covid came around, the tools of risk analysis were instantly applicable. We designed a universal set of tools to understand risk and crowd safety and primarily how best to communicate with crowds. The focus is on influencing crowd behavior. Understanding how their behavior will be affected by their perceptions of risk, not necessarily actual risk, the perception of covid transmission. So, most of the work we developed in risk assessment was just a change in the basic numbers. In practical terms, we used to talk about maximum safe density, being 4 people per square meter in a queueing space, but now parameter just changed to 2 square meters per person for prevention of transmission. The formulas, principles and applications of the risk and safety assessments are not different, but the values you, the basic numbers you apply were different.

In Europe we chose to stay into lockdown while in Asia already big events are going on. Why is this possible over there?

It is important to note that a lot of communities from Asia are used to wearing face masks. The transmission of airborne diseases was regulated and controlled and there is a different starting protocol for diseases like corona. That may well have a significant factor on mass gatherings. Levels of proximity and levels of hygiene are very different in different societies. Wearing face masks is ingrained in other societies, but new to the Western World. Here in the UK, you still have an amount of people who don't understand how to wear a mask properly. So, there is a risk of transmission, if you want to put them in close proximity; such as screaming and shouting, enjoying themselves and touching. I think you need to map how we used to behave at events and how we expect to behave in the future before we even consider mass events starting again. The rules are still difficult to comprehend. In the UK I counted dozens of guidance rule changes last year. You cannot expect society to know the norms anymore, and these rules are still changing.

The problems are these changing cultural norms and evolving rules of behavior in public spaces. People adapt to their environment and this defines behavioral norms as opposed to cultural norms. An example is that you will accept high density in front of a stage, but you would not accept the same density queuing in a canteen. The environment shapes your behavioral norms. A year ago, basically the rules were torn up. I do not shake hands with people anymore which is really odd. Now you have the entire structure of your life suddenly changed. What are the new behavioral and cultural norms, now and in the future?

We have behavior that is acceptable in certain environments that are not acceptable if you go somewhere else. So, I think it is dangerous to lump multiple variables together and say that events are safe, because we see it happening in China.

We see a trend of people polarizing on their perceived reality. Corona is a serious problem regarding a hoax, no more than a flu. Are risk perceptions of visitors in the context of the pandemic becoming more crucial?

You need to understand that the perception of the risks of catching covid, of then becoming very ill from covid, and their perception of the rewards of joining an event and where the risk/reward is balanced in the mind of the participant. I've seen people risk climbing 100m drainpipes to get into a stadium, even if there is a 100m drop on the other side. Risk is weighed against reward, that's the way to understand how people may behave.

It's not about numbers or understanding how many people you can socially distance at an event. It's about how do you think they are going to behave given this balance of factors in their minds: the risks, the rewards, the perceived freedom of act, the beliefs whether covid exists or not, whether vaccinations work. You can calculate the capacity of a space, and ensure that social distancing can occur, but when people enter that space, they may cluster, talk, meet, socialize and the calculation means nothing. We're seeing that at venues as they re-open. We're social animals and have a need to cluster, to talk, to share experiences.

> It is a wise man that learns from his own mistakes, but it is a wiser man that learns from mistakes of others.

In risk analysis you must take these sorts of perceptions into account. Public perception of risk needs to be managed. But when you are competing with social media messages, for example that Bill Gates is microchipping everybody with these vaccinations – really – you have a mobile phone that tracks your location and which websites you visit. Even if it were possible, there is a system you already subscribe to tracks you already.

However, there are all manners of sub fringes in society who believe anything. You need to monitor and manage that when you organize an event. To highlight this, there are three types of crowd behaviors that are currently emerging covid Cautious (following the rules, wearing masks, observing social distancing), Celebratory (exuberant) or Contentious (protesting). In the covid cautious examples, we need to plan for, and manage spaces differently, we need to consider security screening/searching Compliance to the local/Govt regulations (and these are changing almost by the week). Essentially, the Govt guidance is outlining the processes for this classification of crowd behaviour. However, there we are seeing a rise in the exuberant behaviour "it's warm, sodd the rules, let's party" which, by the nature of the crowd, leads to conflict with the authorities. The third type is the crowds that are protesting. As observed at the recent protests against the super league. The problem we are seeing is that this doesn't fit into our conventional planning models since the behavioural aspects and covid safe planning can be at odds with the crowds.

Three very different types of behaviour that you may need to factor into your planning. That might be very different next year, or next month, or tomorrow.

Could you say that one person who might act in a certain way involving risk is enough to monitor these kinds of possible perceptions and behaviors? It can have large consequences if others copy the behavior.

We call that cascade dynamics. What is the influence of one, two, three going into a direction and what if this grows exponential? A good example of this is a person climbing to the top of a festival tent (such as the incident in California a few years ago) 'If he/she can do it, I can do it too'.

But there are physical limits, limits that break the system, with, potentially, hundreds of people getting injured. We see that effect, and it's often the cause of mass injuries. An example is the rumor cascade. 'There is a shooter or a snake on the bridge!' That kind of information can cause a crowd reaction. However, if you understand how a cascade dynamic propagates, then you can mitigate those types of risks.

In the context of covid there will always be a proportion of people who will obey the rules, a proportion of people who will ignore the rules and a proportion of people who never will understand the rules.

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These proportions will differ per event, per environment. What we try to do, is to assess that proportionality. When we have indicators that 50% of our audience never believed that covid exists then we plan accordingly. If it is 10%, we will work on leading by example, sometimes called the elevator effect.

So you can also use this effect in your advance?
There is a famous social engineering examples of how people stand in an elevator. The experiment shows how easily people adapt to the people around them. In an elevator, most people stand facing towards the door. But when the person in the elevator decides to stand facing towards the back of the elevator, the second person entering the elevator will probably do that too. Then afterwards everybody will stand with their faces towards the wall.

When all the staff are wearing masks, and a bunch of guests are wearing masks people are likely to influenced by that example and comply with mask wearing. But when you state a rule in advance that you must wear a mask to get in, that can lead to conflict. There will be groups who decide in advance that this is not how they are going to behave, they may rebel against mask wearing. Enabling compliance by example is much easier to implement. You can create that level of reinforced behavior by using imbedded information and giving people a reason why this is the norm. That's the work we do.

Do you have an example of influencing crowds to do the right things, the safest things?
Before covid I was working on a project where they wanted to reduce the number of bags people brought into an event. The organization used all kind of signs 'don't take bags', but every time someone was stopped, they had all kind of discussions and conflict. People behind the bag's carriers, arguing their rights to of access, started complaining. It was a big problem with crowd management at that specific venue. It was more effective to say that you can bring your bag but need to go to the back entrance for a safety check - which is the farthest away, with the slowest operators. You facilitate their apparent needs, but now make it longer, more inconvenient, to get into the venue. After experiencing two events people will then leave their bags at home. People get rewarded coming without a bag by quicker entrance.

And it will be the same if you find such solutions for using a mask. There should be multiple ways to reward positive behavior and discourage unwanted behavior. If you refuse to wear a mask, that is okay; you have to be in this area way back from the stage with the worst acoustics. Look for psychological tricks to offset behavior.

It is also important that you choose a bottom-up approach. If you impose top-down restrictions, you must think about all the exceptions and be careful with changes. If you apply bottom-up rules, then you can evolve adaptive behavior. Listing rules of things you cannot do is basically suppressing the crowd and people can resent that. We like to encourage positive behavior and turn it into lists of things you can do. Fundamental change is only implemented with understanding the consequences of actions and risks. So, explain the situation in common sense terms, rather than induce top-down rules.

What will be the big challenges for the upcoming times?
There will be different types of crowd risk associated with the transition phase from getting from lockdown back to (new) normality. We may need to understand the new norm of crowd behavior after lockdown to write a new rule book. How are we going to regulate crowds going forward, into the new normal? What type of coordinating do we need? How do we establish behavioral norms for this type of events that are going to be forthcoming, for the new normality?

At the time of this article, there is a balance between trying to control a pandemic when the public and the politicians really want to celebrate their release from lockdown and return to freedom and normality. My concern is that politicians are basically hedging their bet. It takes months to put big events together and it takes many more months for people to understand what the new rules for events are. We've seen politicians waiting until a few weeks before the event to decide to give the green light, the go-ahead, it's a recipe for disaster.

What if politicians say the event can go ahead and we suffer a massive spike of covid infections? Is the politician who made the decision responsible for the deaths? Do we leave the decision to the last-minute hoping that a scientist somewhere will say 'it is all over' that is just not going to happen? It's a balance between public safety and public acceptance of the current situation.

Will there be sustainable effects of the pandemic on the short and long run?
First, there is an economic supply chain issue. The event sector is a huge industry with a lot of involved support companies. An event organizer needs a large group of lightning engineers, staging engineers, site engineers, tent suppliers, barriers, toilets, food and beverage companies and so on. But all these people have had zero income for months. Many went bankrupt and may not want to come back in the event industry that is so uncertain. Insurance policies and financial structures will change. For example, they may need to get paid in advance, that may change the economic balance for future events. The whole event horizon is shifting. The supply chain and costing may be completely different.

Secondly, there is a behavioral issue. People will fall into two distinct categories: 1. a group who wants to go back because they always enjoyed events, and 2. a group who feels that being in crowds will possibly cost lives. I know from polls that 60% wants to go back and 40% believes now that they never go to an event ever, because it's too risky. This percentage may shift if we get a better grip on the virus. Vaccination passports, local testing, lateral flow testing, it's a massive social engineering and there are currently pilot studies to monitor the situation as events open again, but slowly.

And what about insurance? Is it strange that we did not see claims yet?
There were no big events, most/all were cancelled. For smaller events or visiting a shop it's hard to prove causality of the likelihood that an infection five days after visiting it. So insurance claims may be filtering through the system. But slowly. If large numbers of people, visiting a big event, triggers a spike of infections afterwards, this is statistically different to smaller crowds at smaller events. However, legal cases can take several years to come to court and there is a burden of proof required. Two years from now we may see legal cases relating to covid-infection, its uncertain at the moment.

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Safety is going into a new dimension in terms of contagious diseases and insurance. Insurance policies have always considered the known risks. We ran a workshop in the USA, looking at the worst-case scenario of a multiple-day event where on day 3 an outbreak of food poisoning emerged. What to do? There are 2 more days to run, but there is a suspicion that you might be the source. Are you insured for the consequences and subsequent potential claims? That depends on the contracts with your vendors – it's complicated. What would happen if, say, 10 days after an event there is a spike of covid infections in a local community? For example, when Real Madrid played in Liverpool, there was a spike of covid infections in Liverpool afterwards. There is liability? Might there be lawsuits involved with that? Talk to anyinsurance company about what happens when your event is associated with a spike of covid infections, and there is a lawsuit against you because you failed to have an appropriate safety process/procedure or policy. What do you think might happen?

Can you still insure events? Can you organize events without insurance? Even before, many festivals barely could cover the costs. And now there is more uncertainty about ticket sales and at the same time, the costs will go up. You need to sell more tickets to higher prices with a more fragile infrastructure needed to get paid in advance. Some events need large numbers to cover the costs of performers and suppliers. Even city-wide based events may struggle with insurance and smaller budgets, and higher costs because we need to increase the police presence to enforce new measures on safety. Break-even analyses will become the fundamental driver for future events.

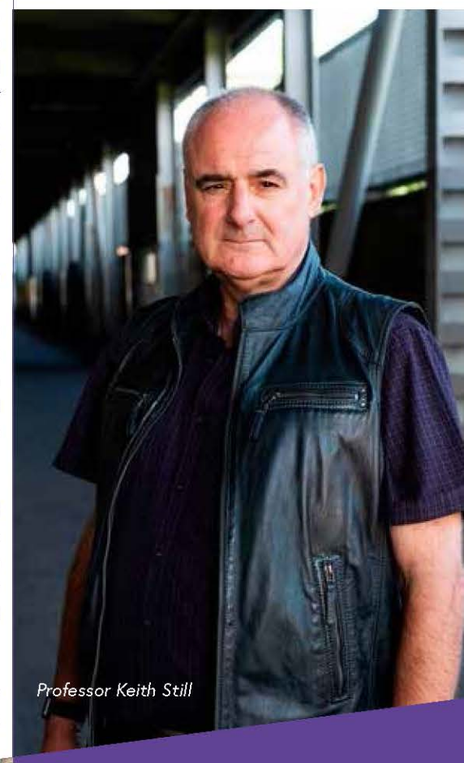
And what does this mean for education on events and crowd management?
I think the whole dimension of economics and logistics will be more important for event planning. The importance of crowd science in support of managing risks is important and changing as we learn more about the nature and transmission of the virus.

Besides that, the appreciation of crowd psychology is needed in terms of the public perception of risk and the whole dimension of influencing your crowd, your sponsors, your staff and other stakeholders is going to need a rethink.

A new set of new skills is needed, such as how to convince your insurance company, suppliers, banks, city government, or audience of the following:

1. That it is safe to start major events again
2. That managing the supply chain payment stability of your finance chain is essential
3. That you have a robust risk assessment and insurance policy
4. That you can tackle new logistic challenges
5. That you manage site/event security if it is problematic to touch people (consider the search process)

We are going to see some major challenges ahead as we adapt to the new normal.



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